

Caregivers' perceptions of access to specialized outpatient services for children born from mothers diagnosed with COVID-19

Percepções dos cuidadores sobre o acesso a serviços ambulatoriais especializados para crianças nascidas de mães diagnosticadas com COVID-19

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ABSTRACT | INTRODUCTION: Children born from mothers diagnosed with COVID-19 may face developmental challenges that require multidisciplinary care. **OBJECTIVE:** To understand access to specialized outpatient services for children born from mothers diagnosed with COVID-19 and assess their development and family context. **METHODS:** A cross-sectional, mixed-methods study conducted with children of both sexes, aged 2–3 years, born from mothers diagnosed with COVID-19 during pregnancy. Stage 1 consisted of developmental risk screening performed in the first year of life using the Brazilian version of the Survey of Wellbeing of Young Children. Stage 2, carried out two years later, involved semi-structured phone interviews with caregivers addressing access to specialized services and child development. The quantitative analysis included data from both stages, whereas the qualitative analysis focused on responses from the Stage 2 interviews. Descriptive statistics were performed using SPSS 20.0, and qualitative data were thematically analyzed. **RESULTS:** Of 14 children included, six were identified as at risk for developmental delay in Stage 1, of whom two accessed specialized outpatient services. In Stage 2, eight caregivers reported concerns about delays in developmental milestones, half of whom had already been classified at risk in Stage 1. Among these, two were referred for outpatient follow-up. Regarding the family context in Stage 2, nearly half of the children were at risk of food insecurity, and some caregivers reported a need for psychological support and family violence. **CONCLUSION:** Caregivers' perceptions highlight limited access to outpatient services, and a complex family context marked by food insecurity and violence.

KEYWORDS: COVID-19. Child Development. Outpatient Care. Food Insecurity. Exposure to Violence.

RESUMO | INTRODUÇÃO: Crianças nascidas de mães diagnosticadas com COVID-19 gestacional podem enfrentar desafios no desenvolvimento que requerem cuidados multidisciplinares. **OBJETIVO:** Compreender o acesso a serviços ambulatoriais especializados por crianças nascidas de gestantes diagnosticadas com COVID-19 e avaliar seu desenvolvimento e contexto familiar. **MÉTODOS:** Estudo transversal, de métodos mistos, com crianças de ambos os sexos, entre 2 e 3 anos, nascidas de mães diagnosticadas com COVID-19 na gestação. A Etapa 1 consistiu na triagem para risco de atraso no desenvolvimento no primeiro ano de vida, utilizando a versão brasileira do *Survey of Wellbeing of Young Children*. A Etapa 2, conduzida dois anos depois, incluiu entrevistas telefônicas semiestruturadas com cuidadores sobre acesso a serviços especializados e desenvolvimento infantil. A análise quantitativa reuniu dados das duas etapas, enquanto a qualitativa focou nas respostas da Etapa 2. Foram realizadas estatísticas descritivas no SPSS 20.0, e os dados qualitativos foram analisados tematicamente. **RESULTADOS:** Das 14 crianças incluídas, seis foram identificadas em risco de atraso no desenvolvimento na Etapa 1, das quais duas acessaram serviços ambulatoriais especializados. Na Etapa 2, oito cuidadores relataram preocupações com atrasos em marcos do desenvolvimento, sendo metade já identificada em risco na Etapa 1. Dessas, duas foram encaminhadas para acompanhamento ambulatorial. Quanto ao contexto familiar na Etapa 2, quase metade das crianças apresentava risco de insegurança alimentar e alguns cuidadores relataram necessidade de apoio psicológico e experiências de violência familiar. **CONCLUSÃO:** As percepções dos cuidadores evidenciam acesso limitado a serviços ambulatoriais e um contexto familiar complexo, marcado por insegurança alimentar e violência.

PALAVRAS-CHAVE: COVID-19. Desenvolvimento Infantil. Assistência Ambulatorial. Insegurança Alimentar. Exposição à Violência.

1. Introduction

The COVID-19 pandemic, declared by the World Health Organization in 2020¹, brought an atypical context characterized by social isolation, changes in family life, work environments, education, and community social interactions^{2,3}. In an effort to contain the spread of the new coronavirus between 2020 and 2021, countries such as Brazil implemented strict lockdown measures, suspending all non-essential activities and restricting the movement of people and vehicles².

These social restrictions led to the suspension of educational activities as well as the closure of businesses and commercial establishments, with no clear timeline for a return to normalcy³. The adverse effects of these measures were not limited to adults; infants born during the early stages of the pandemic were deprived of opportunities for social interaction with the community, with peers, and extended family members⁴.

The lack of exposure to external environments may have influenced the development of social communication skills⁵, motor functions⁶, and increased the risk of developmental delays⁷. Although children were less susceptible to severe infection by SARS-CoV-2 and often asymptomatic⁸, exposure to viral infections, including in utero, has been associated with an increased risk of developmental changes due to complications such as fetal neuroinflammation and neurological issues⁹⁻¹¹.

A previous study conducted in 2021 in Northeast Brazil, involving infants born from mothers diagnosed with COVID-19, found that those exposed to the virus in utero had a higher risk of motor developmental delays and socio-emotional issues compared to unexposed infants¹². These findings raised concerns about how this population is being monitored, especially considering that even before the pandemic, access to specialized outpatient services in Brazil faced challenges such as limited appointment availability and geographical barriers^{13,14}.

Thus, given the increased risk of developmental delays and the pre-existing challenges in accessing

specialized outpatient services care in Brazil, this study aims to understand access to multidisciplinary outpatient services for children born from mothers diagnosed with COVID-19, as well as to assess their development and the family context in which they live.

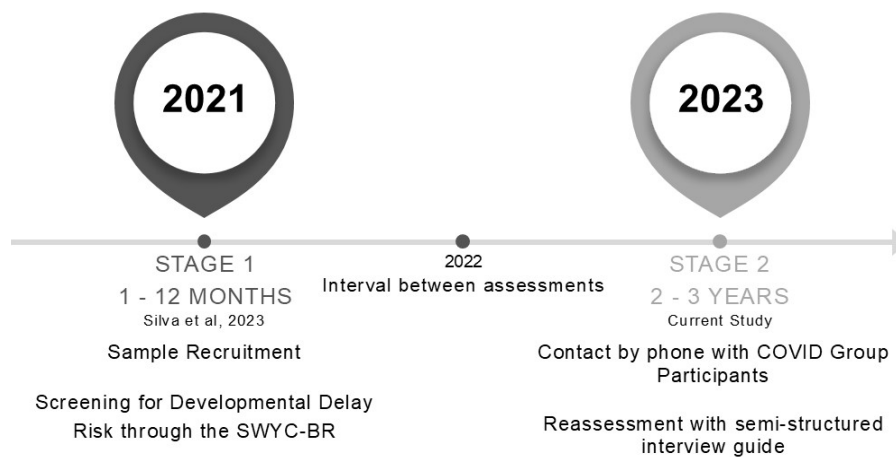
2. Methods

2.1 Study design

This is a cross-sectional, mixed-methods study¹⁵ that combined a quantitative approach, with data obtained from a semi-structured script and from the results of a previous study using the Brazilian version of the Survey of Wellbeing of Young Children (SWYC-BR)¹⁶, and a qualitative approach, aiming to identify access to specialized outpatient services and reports of developmental delays. The qualitative component was carried out through semi-structured interviews, developed based on SWYC-BR data. This is an open-access tool designed to assess multiple aspects of child well-being, covering developmental milestones, behavioral and emotional indicators, as well as family risk factors. The instrument consists of 12 screening forms, developed for children under 65 months of age, and presents satisfactory psychometric properties for application in research and clinical practice¹⁶.

The study is a follow-up of children previously assessed and was conducted between August and September 2023, focusing on children born from mothers diagnosed with COVID-19 during pregnancy. Participants were initially screened during their first year of life (Stage 1) in a prior study¹², which assessed the risk of global developmental delays and socio-emotional changes in infants born from mothers infected with COVID-19 (COVID Group), compared to those without intrauterine exposure (Control Group). Two years later, a follow-up assessment (Stage 2) was conducted exclusively with the COVID Group. Stage 2 combined quantitative data from Stage 1 with qualitative analysis from responses to a semi-structured interview guide. Figure 1 illustrates the stages of the project.

Figure 1. Project Stages



Source: the authors (2025).

The study was approved by the Research Ethics Committee (4,032,153) and followed the Declaration of Helsinki and Resolution 466/12 of the National Committee of Ethics in Research.

2.2 Participants

In Stage 2, children from the COVID Group of Silva et al.'s study¹², aged 2 to 3 years, whose parents responded to phone calls and agreed to participate, were included in a follow-up interview on access to specialized outpatient services and child development. The inclusion criteria required willingness to participate in the follow-up and prior participation in the COVID Group. Sample losses included cases of infant death, incomplete assessments, loss of contact, or withdrawal from the study.

Parents were initially contacted by phone, and if unavailable, they were invited to schedule the interview via WhatsApp Messenger, where the researcher coordinated a suitable time with the child's primary caregiver.

2.3 Access to specialized outpatient services, developmental delays, and family context

The Stage 2 interview used a semi-structured interview guide developed by the authors, which included 12 questions phrased in simple language (Table 1). The questions assessed access to specialized services and included items covering two SWYC-BR domains (developmental milestones and family risk factors), aimed at identifying developmental delays, domestic violence, food insecurity, and parental depression. Specialized services were defined as consultations outside of routine pediatric care, such as physical therapy, speech therapy, or psychological support.

The SWYC-BR results from Stage 1¹² were also used in this study to compare findings between the initial assessment (Stage 1) and the follow-up reassessment (Stage 2).

Table 1. Semi-structured interview guide

Questions to gather information on developmental milestones
Does your baby walk? If so, at what age did they reach this milestone?
Do they walk across a room without help?
Can they say their own name?
Do they run (without help)?
Can they climb stairs without another person's help?
Do they talk with other people and are they understood most of the time?
Question to gather information on the access to specialized outpatient services
Besides the pediatrician, did your baby need follow-up with any type of professional (e.g., physical therapist, speech-language therapist)? Did they need to be assessed by any professional other than the pediatrician?
Questions to gather information on the family context and environment
Where does the child spend most of the day (e.g., at home, in daycare)? Since when?
In the past 2 years, has there been any family conflict that required assistance from the police (e.g., fight with a family member)?
In the past 2 years, have you worried that food might run out before you could buy more?
Since your baby was born, do you feel happier or sadder? And regarding caregiver burden/overload — more, less, or about the same as before?
Have you needed psychological or psychiatric support since our last assessment?

Source: the authors (2025).

2.4 Data analysis

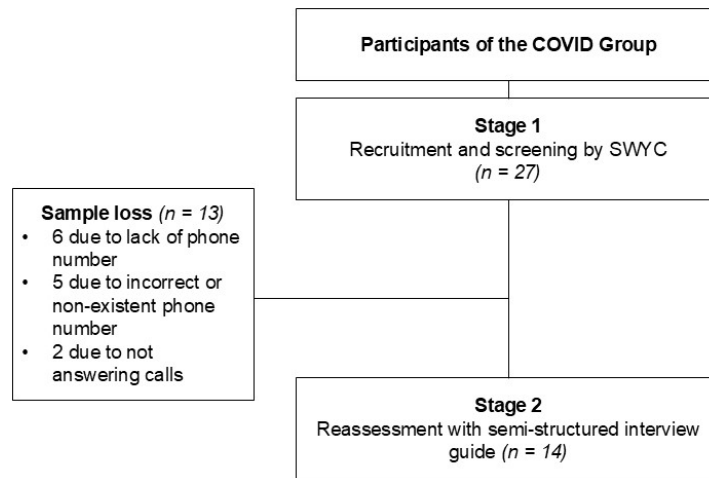
For the qualitative analysis, the interviews were audio-recorded, transcribed verbatim, and organized into a spreadsheet by a researcher. Thematic analysis, based on Braun and Clarke's methodology¹⁵, was employed to identify and describe patterns in participants' responses. The primary researcher conducted the analysis, with support from a qualitative research specialist for guidance and clarification.

For the quantitative analysis, responses related to access to specialized outpatient services, developmental delays, risk of food insecurity, domestic violence, and need for psychological support were categorized as "yes" or "no" and entered into a database for descriptive analysis. Descriptive statistics were performed using the Statistical Package for Social Sciences (SPSS, version 20.0; IBM SPSS, Chicago, IL, USA). Continuous variables were described using mean and standard deviation, and categorical variables by frequency and percentage. Data normality was assessed using the Shapiro-Wilk test to determine appropriate measures of central tendency.

3. Results

Of the 27 infants exposed to COVID-19 assessed in Stage 1, 14 were reassessed in Stage 2. Figure 2 illustrates the participant flow in the study, and table 2 presents the sample characterization.

Figure 2. Flow of research participants



Source: the authors (2025).

Table 2. Sample characterization (n=14)

Characteristics*		
Sex		
Female	6	(42.9)
Male	8	(57.1)
Gestational age classification		
Preterm	5	(35.7)
Term	9	(64.3)
Gestational age at birth (weeks)	37.3	(1.8)
Age at Stage 2 (years)	2.4	(0.3)

Source: the authors (2025).

*Data expressed as *n* (%) or mean (standard deviation).

Among the 14 reassessed children, six were identified as being at risk for global developmental delay during Stage 1. In Stage 2, the analysis of caregiver narratives revealed reports of developmental milestone delays in eight cases. Among these, all reported difficulties specifically related to language development:

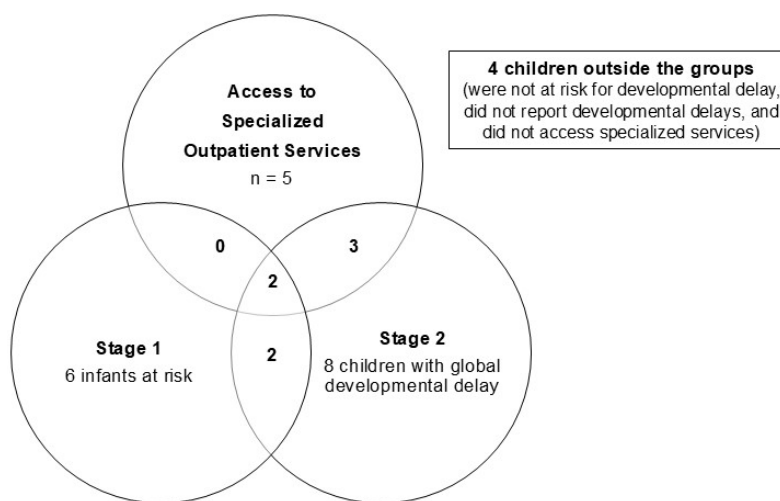
"No (does not say his own name). [...] I already see younger children than him who, like, know how to form small sentences, like, 'give water.' He doesn't do that; he also doesn't say 'water' [...] sometimes he tries to talk, but he just makes a lot of noise, not forming words, as if he wants to communicate but cannot form words."

"No. Not yet (does not say his own name). In terms of motor development, like walking and running, he developed normally. But when it comes to speech, he doesn't talk. He says very few words, just 'mommy' and 'daddy.' And he doesn't understand commands very well either."

"He started walking at 1 year and 6 months. No (does not say his own name). He only says 'mommy' and 'daddy' [...]."

Only two of the six children identified as “at risk” in the initial assessment accessed specialized services. Furthermore, among the eight cases that exhibited developmental milestone delays in Stage 2, four had been classified as at risk for global developmental delay in Stage 1. Figure 3 presents a Venn diagram illustrating the overlap between infants identified as at risk for global developmental delay in Stage 1, children with reported global developmental delays in Stage 2, and those who accessed specialized outpatient services.

Figure 3. Infants at risk for global developmental delay in Stage 1, children with reports of global developmental delay in Stage 2, and access to the specialized outpatient service



Source: the authors (2025).

Two parents expressed difficulties regarding access to specialized outpatient services:

"No, he only had that evaluation you did, and that's it. He doesn't even have a pediatrician anymore because the local clinic here changed everything [...] there's no pediatric follow-up for him."

"She had speech therapy for a while because it was covered by my husband's work insurance. We were taking her to therapy, but then he lost his job, and we're still planning to get her back into therapy because she really needs it. She only did speech therapy for a few months because it was so hard to get an appointment [...]."

Among the specialized services sought, one child was in physical therapy, and four children were undergoing speech therapy, with one of them also receiving psychological support.

Four parents of children who had not been identified as at risk for global developmental delays in the initial assessment reported developmental milestone delays during the Stage 2 interview. A total of nine subjects had no access to specialized outpatient services. From them, two (22.2%) were reported as having global developmental delay risk on Stage 1 and were also reported as showing global developmental delay in Stage 2. Table 3 provides a descriptive analysis of the risk for global developmental delays in Stage 1, reported global developmental delays in Stage 2, and access to specialized services for these children.

Table 3. Descriptive Analysis on Developmental Delays, Reported Global Developmental Delay, and Access to Specialized Outpatient Services (n=14)

Global developmental delay risk at Stage 1 n (%)		Stage 2		
		Reported global developmental delay	Access to specialized outpatient services	
			Yes n (%)	No n (%)
No risk	8 (57.2)	Yes	3 (60.0)	1 (11.1)
		No	0 (0.0)	4 (44.4)
With Risk	6 (42.8)	Yes	2 (40.0)	2 (22.2)
		No	0 (0.0)	2 (22.2)
TOTAL	14 (100.0)		5 (100.0)	9 (100.0)

Source: the authors (2025).

In terms of socio-emotional and behavioral development, 12 infants were identified as at risk for socio-emotional changes during the SWYC-BR screening; however, in Stage 2, only one caregiver reported psychological follow-up: *"He goes to speech therapy and sees a psychologist once a month."*

Regarding family aspects, four caregivers were classified as experiencing food insecurity during Stage 1, while six caregivers were classified in the same situation in Stage 2 when asked if they worried about running out of food before they could afford more. One mother responded: *"Yes. There are months when things are tighter, and we worry it won't be enough."* Another caregiver stated: *"Yes, because I can't work. It's just my husband providing for us, you know?! And my daughter has a lot of expenses. The neurologist prescribed medication to help her sleep because she doesn't sleep well. It makes things even harder."*

During the reassessment (Stage 2), two caregivers were classified as being at risk for family violence. Seven caregivers reported needing psychological support, but only three were receiving care from a psychologist.

The need for access to psychological services was highlighted in some statements:

"I think I need it, I really do. I just couldn't get psychological help here. I tried, but there were no appointments available—it's very hard to get here [...]."

"I feel the need (for psychological support), but I haven't sought it out yet. I plan to look into it."

4. Discussion

This study aimed to understand access to specialized outpatient services for children born from mothers diagnosed with COVID-19, as well as their development and the family context in which they live. The results revealed that less than half of the children evaluated in Stage 2 had access to specialized outpatient services, and more than half of these children showed evidence of delays in developmental milestones during the follow-up reassessment. Additionally, the children in this study were found to be in a complex family context, characterized by exposure to food insecurity and violence.

The lack of access to specialized outpatient services and the identification of developmental delays in the children of this study highlight a challenging and concerning context regarding child monitoring in Brazil. These findings align with previous studies that indicate the Brazilian healthcare system faces several barriers^{13,14,17}. These studies suggest that factors such as waiting times for appointments, distance to service locations, availability of scheduling, and the attitudes of healthcare professionals impact adherence to and continuity of care^{14,17}. Moreover, it is believed that the limited access to specialized services observed in this study was exacerbated by the pandemic, as health services, particularly in areas such as maternal, neonatal, pediatric, and adolescent care, were disrupted due to the COVID-19 outbreak^{18,19}.

More than half of the parents of the reassessed children reported delays in language development; however, only four children were receiving speech therapy. In line with this finding, Frota et al.²⁰ demonstrated that infants who experienced the

pandemic early in their development exhibited lower scores on communicative development measures, due to reduced exposure to social interaction compared to previous periods.

Furthermore, despite only one child receiving psychological support in Stage 2, the majority of those reassessed were identified as being at risk for socio-emotional disturbances during Stage 1. The unique context of the pandemic, characterized by factors such as social isolation, school closures, reduced social interactions and physical activities, exposure to family discord, and other stressors^{21,22}, may have negatively impacted socio-emotional development, explaining the findings from the initial assessment.

Corroborating the previously mentioned hypothesis, a 2021 study on the impact of school space deprivation on child development during the pandemic, involving children aged one to five, found that the socio-emotional aspect of child development was the most perceived as negatively affected during this period²³. Additionally, a systematic review on the potential impact of the pandemic on child development also showed that this period had the potential to trigger mental and emotional consequences, such as anxiety, in children^{21,22}. This finding highlights the importance of providing adequate support, especially in the context of child development.

Regarding the family context, nearly half of the children were at risk of food insecurity in Stage 2. Gallegos et al. demonstrated that the state, severity, and persistence of food insecurity, along with reductions in the quantity and quality of food provided, may negatively affect child development²⁴.

A study published in 2022 revealed a 54.5% increase in the proportion of underweight children during the pandemic, suggesting that the suspension of in-person school activities was a contributing factor to the heightened risk of food insecurity¹⁹. Furthermore, the Northeast region, where this study was conducted, was the second most impacted by social disparities regarding household access to food before and during the COVID-19 pandemic, with a prevalence of 68% of households facing food insecurity in 2021 and 2022. These data reflect the inequalities resulting from socioeconomic dynamics, local political conditions, and the unequal distribution of national wealth²⁵.

During Stage 2, some caregivers reported a continued need for psychological support and violence in the family context. From a developmental perspective, the family environment is a determining factor, as studies have shown that adverse childhood experiences are associated with negative effects on child development^{26,27}. Additionally, parental depressive symptoms are a risk factor for emotional problems in children²⁸, such as anxiety, emotional reactivity, aggression, and depression²⁹.

Although the findings provided valuable data on the development and access to specialized outpatient services for children born from mothers diagnosed with COVID-19 during pregnancy, this study has some limitations. The sample size is small, partly due to difficulties in contacting some caregivers. However, small samples are common and acceptable in studies of this type, and findings from similar research conducted during the pandemic have shown consistent results³⁰.

Furthermore, no predictive developmental scales were applied to confirm the developmental delays reported by parents. The SWYC-BR, while practical and widely used, relies on caregiver-reported questionnaires and may be influenced by subjective factors such as caregiver knowledge, experience, stress, or anxiety. Nevertheless, despite these potential limitations, studies using the same tool have demonstrated high sensitivity and specificity for detecting severe developmental delays, confirming its reliability as a standardized screening instrument that facilitates early intervention^{12,16}.

Despite these limitations, this is the first longitudinal study conducted in the Northeast of Brazil that sought to understand both access to specialized outpatient services and track the risk of developmental delays in infants born from mothers diagnosed with COVID-19 during pregnancy. Future studies should adopt a similar perspective to further explore the experiences and perceptions of parents, child development, family context, and the barriers faced in accessing specialized services. This understanding is crucial, as it provides a foundation for principles of appropriate healthcare, particularly within the pediatric population.

5. Conclusion

This study emphasizes the importance of early intervention in children at risk of developmental delays, particularly those born from mothers diagnosed with COVID-19 during pregnancy. Despite the high detection of developmental delay risks, the lack of access to specialized outpatient services remains a significant barrier, even after the pandemic. Parents' perceptions further highlight this limited access, with many reporting challenges in obtaining the necessary care. The findings also underscore a complex family context, characterized by food insecurity and family violence, which further complicates the situation.

These challenges underscore the need for effective strategies to increase awareness, ensure better access to services, and promote integrated, multidisciplinary care. Additionally, policies must be developed and implemented to address these disparities, ensuring that vulnerable families receive the support needed for their children's development. Future research should continue to explore these issues, considering the perspectives of caregivers, to better understand the obstacles families face in accessing essential healthcare services.

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Authors' contributions

The authors declared that they have made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis or interpretation of data for the work; and the writing or critical review for relevant intellectual content. All authors approved the final version to be published and agreed to take public responsibility for all aspects of the study.

Competing interests

No financial, legal, or political conflicts involving third parties (government, private companies, and foundations, etc.) were declared for any aspect of the submitted work (including but not limited to grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

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